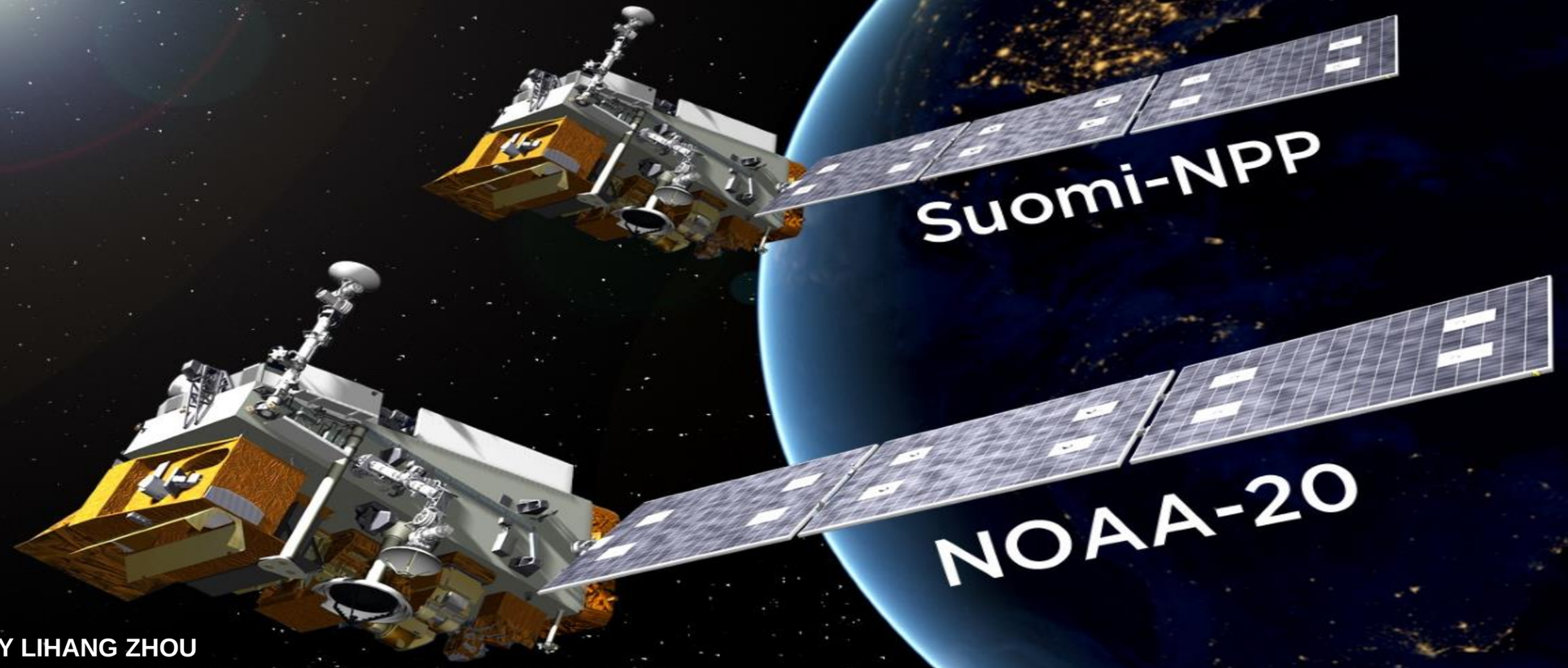
# JPSS-STAR (JSTAR) Program Updates

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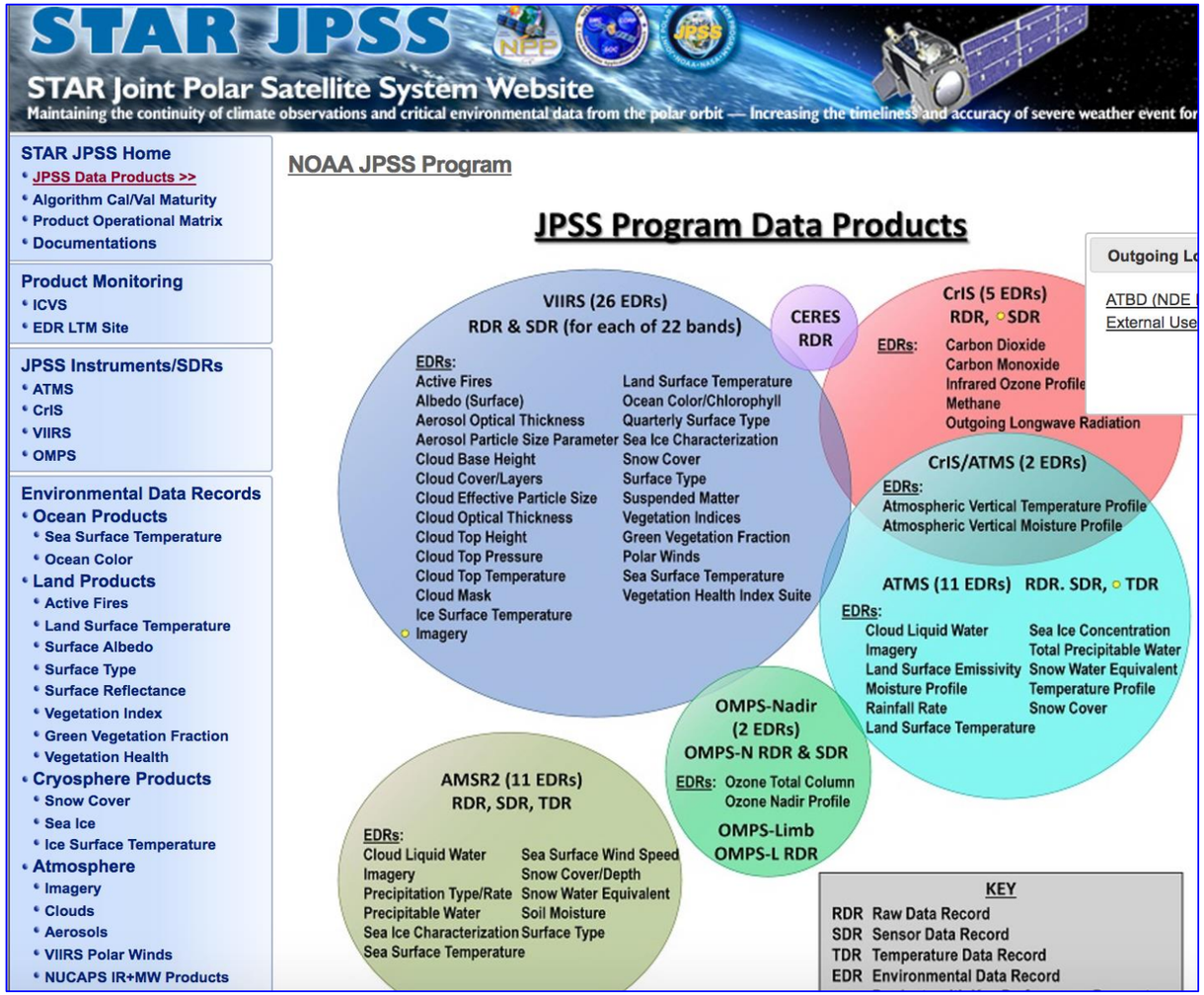
JPSS PROGRAM SCIENCE
JPSS ALGORITHM MANAGEMENT PROJECT (AMP)
ARE THANKFULLY ACKNOWLEDGED

# JPSS STAR (JSTAR) Program

**Goal: To provide *robust, affordable, and flexible state-of-art* scientific solutions to meet JPSS requirements**

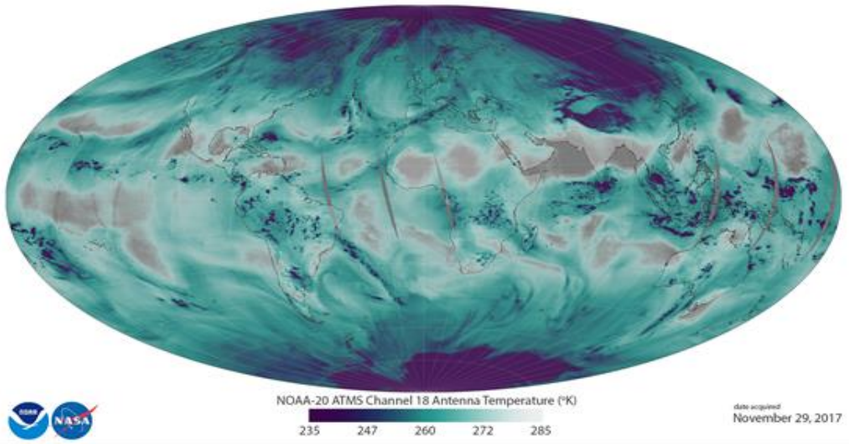
- Leverage hundreds of scientists from NOAA, NASA, DOD, and NOAA's Cooperative Institutes (University partners) and Industry Partners
- Apply first-hand knowledge of algorithms and Cal Val, developed in POES, GOES, DMSP, EOS, MetOP, and GOES-R, for JPSS Program
- Work closely with JPSS Program Science, Algorithm Management Project (AMP), STAR ASSISTT, and all other elements/partners to ensure the developments meet the users' requirements, and efficient science to operation transitions
- Facilitate science consistency across systems
  - Enterprise Approaches (same science for multiple observation platforms)
  - Reprocessing capabilities
  - Blended products for users applications
  - Consistent Cal Val tools for science monitoring and maintenance




**Well calibrated/validated, high quality datasets is the foundation for all applications**

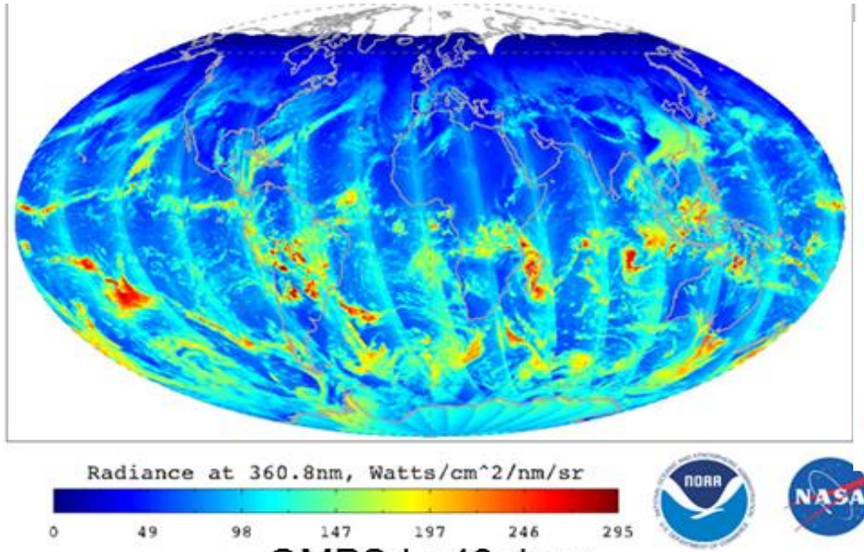
# NOAA-20 (N20) Cal Val Updates

- N20 Launched: Nov. 18 2017
- N20 Post Launch Cal Val Highlights:
  - ✓ ATMS SDR/TDR Beta: Dec. 2017
  - ✓ Key Performance Parameters (KPPs) Beta: Jan 2018
  - ✓ KPPs Provisional (Ready for Operation): Feb. 2018
  - ✓ KPPs declared operational: March 2018
  - ✓ Key EDRs Provisional* (SST, Aerosols, Active Fire, MIRS): April 2018
  - ✓ N20 data used in NWS GFS model; Ozone Beta; Integrated Calibration and Validation System (ICVS) fully functional and public released: May 2018
  - ✓ ATMS, VIIRS SDRs Validated; NUCAPS T/Q Provisional: June 2018
  - ✓ Clouds, SFR, LST/LSA Beta: July 2018
  - ✓ Imagery EDRs Validated; Vegetation Beta: August 2018

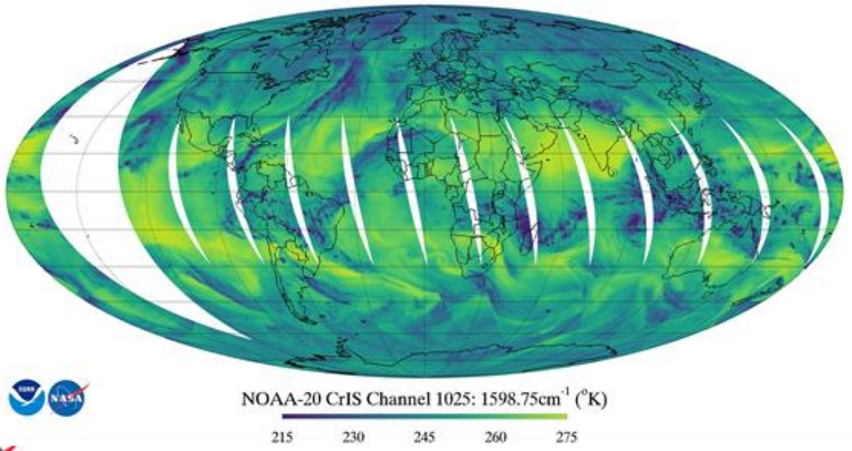


ATMS L+11 days

VIIRS L+25 days



OMPS L+48 days

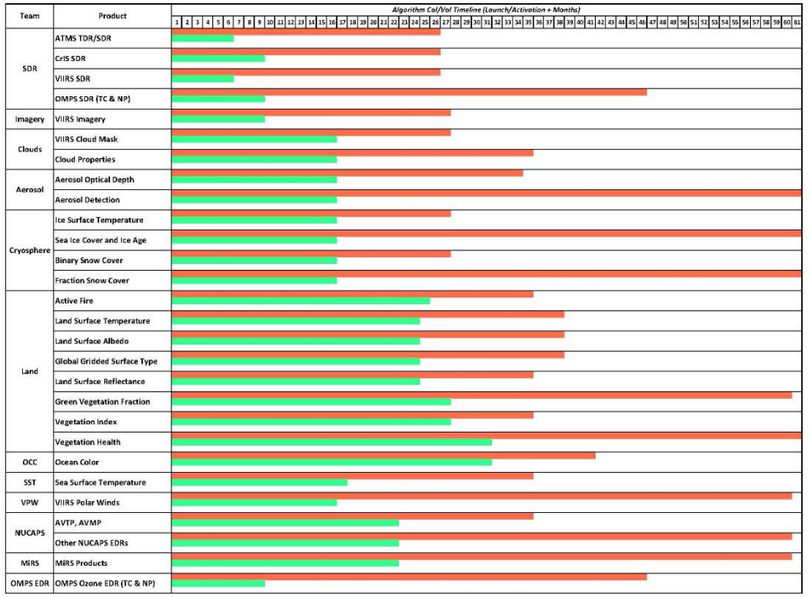


CrIS L+48 days

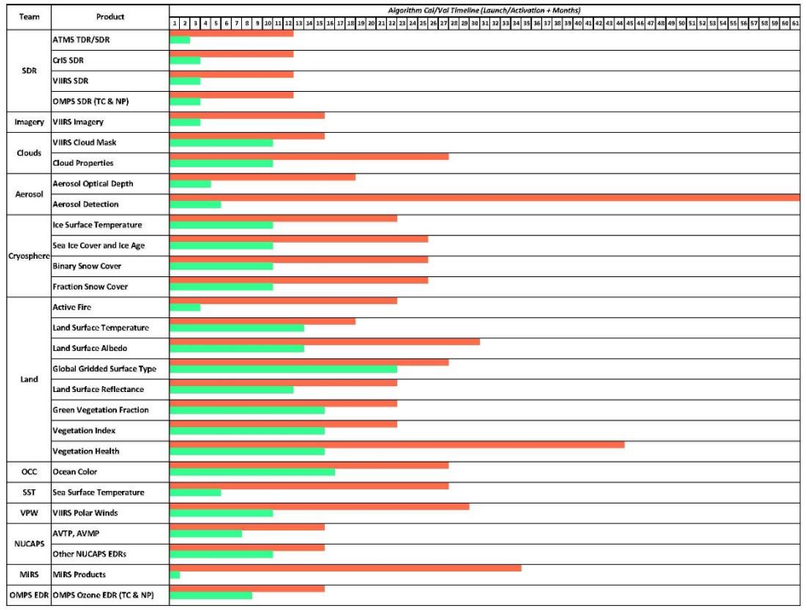
# S-NPP/NOAA 20 Cal Val Maturity

Algorithm enhancements and improvements based on user needs; enterprise algorithms

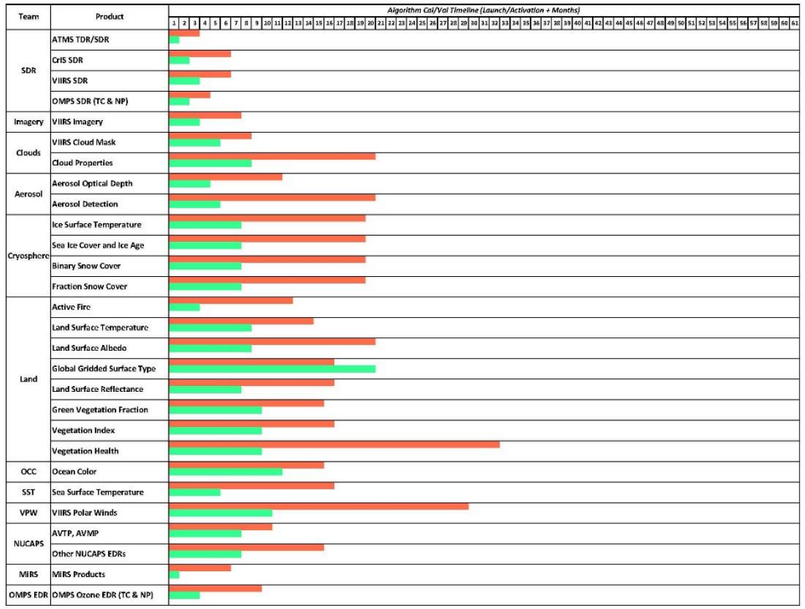
S-NPP **Validated** N-20




S-NPP **Provisional** N-20

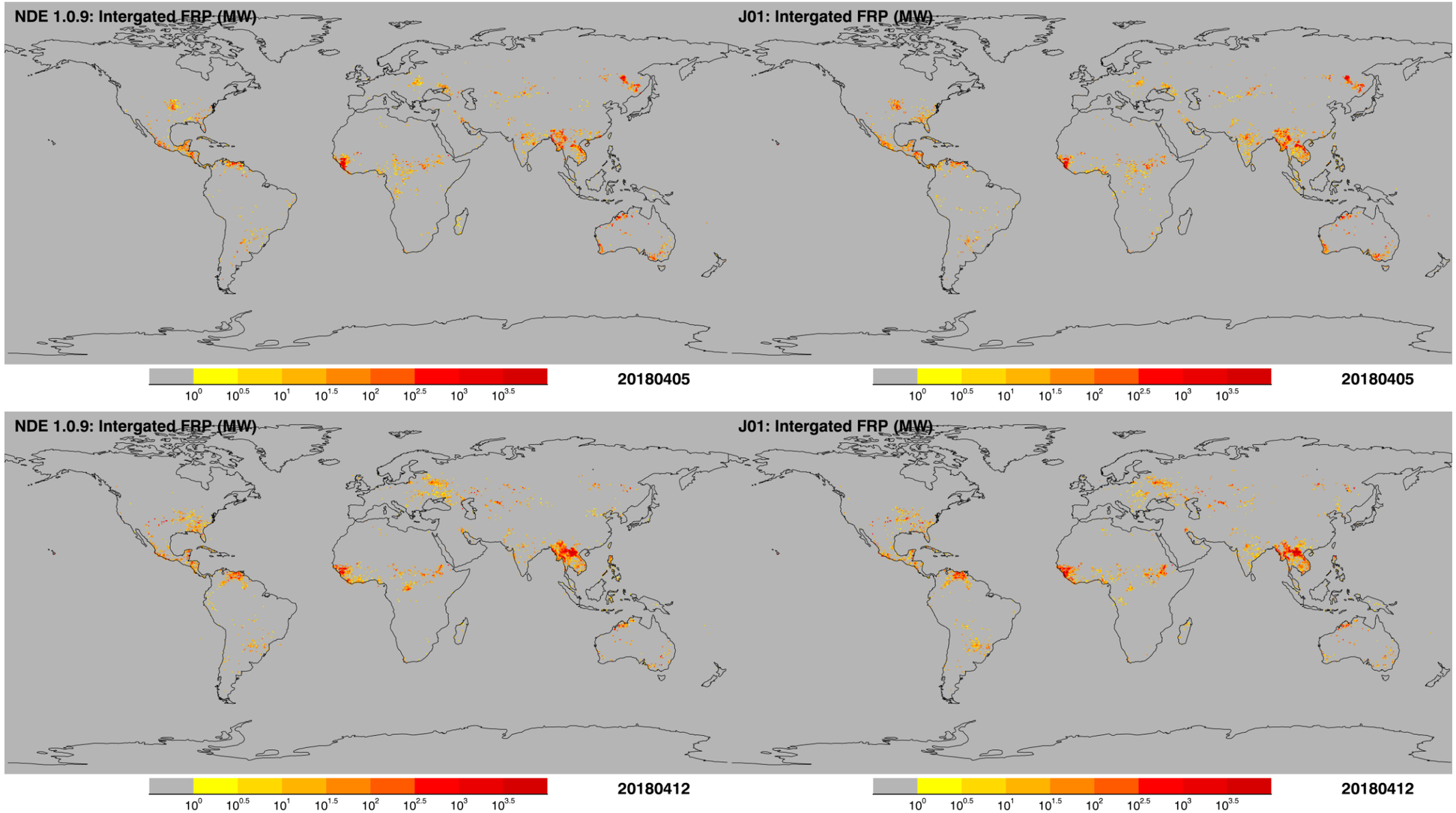



S-NPP **Beta** N-20




Lessons learned from the S-NPP experience helped expedite N-20 Cal/Val Maturity

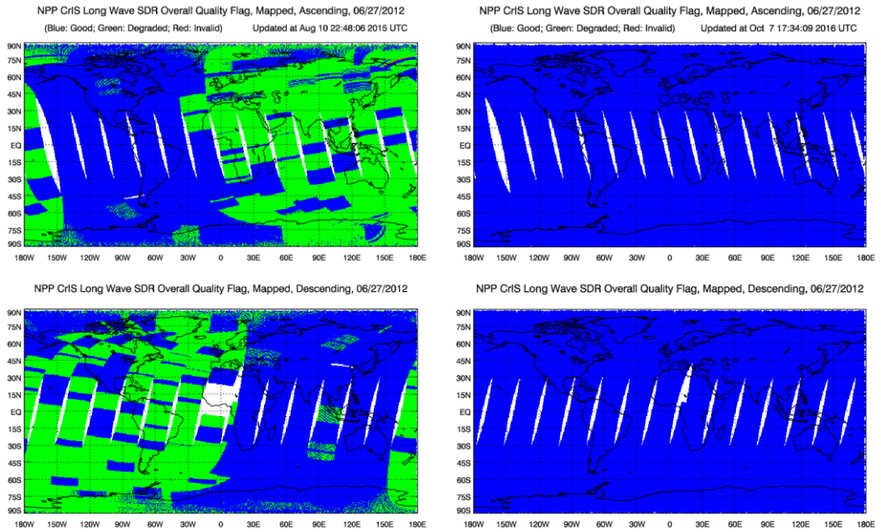
# FRP: Suomi NPP vs. NOAA-20: 750m




***N20 Active Fire Declared Operational June 20 2018!  Lead: Ivan Csiszar***

# STAR SNPP Science Reprocessing - CrIS SDR Data Reprocessing

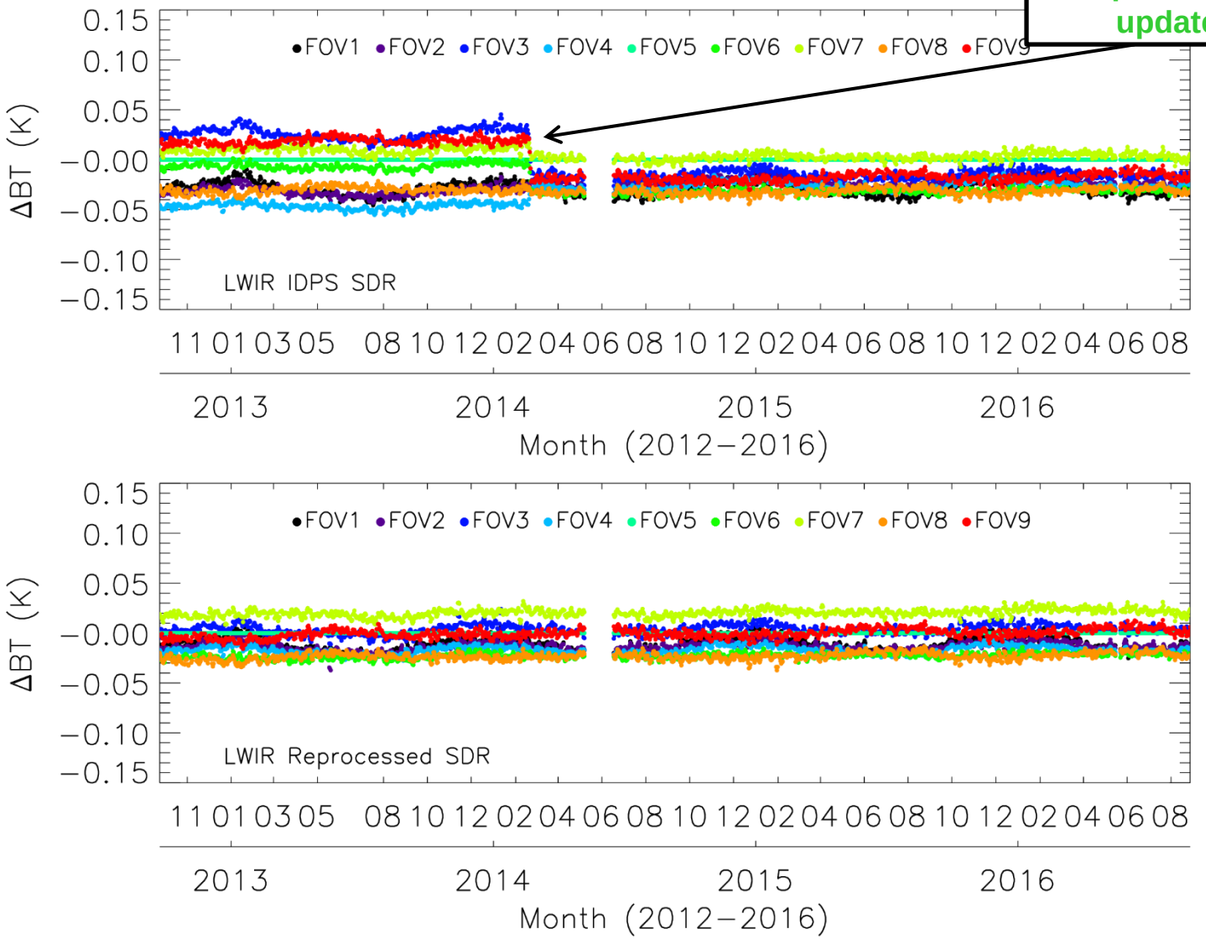
- Engineering packet version 37 and new MW FOV7 NL a2 coefficient
- ADL Block 2.0 with A4 calibration algorithm and improved geolocation algorithm
- TSR SDR for the whole history
- FSR SDR since December 4, 2014
- Latest RDR version
- CrIS TSR data reprocessing from February 20, 2012 to August 31 2016 completed



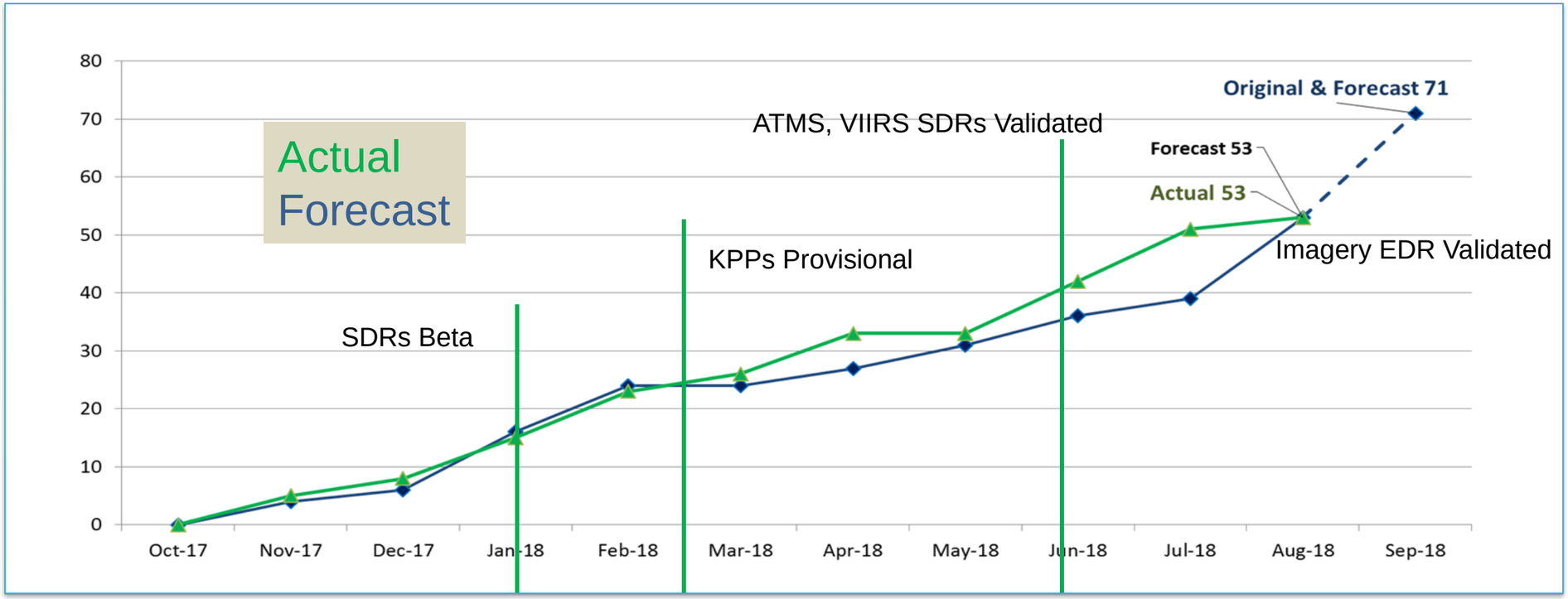

06/27/2012

CrIS Radiometric Stability: Daily Mean FOV-2-FOV Difference wrt FOV5

**02/20/2014 CrIS non-linearity coefficient and ILS parameters update**



# J-STAR Milestones Completion as of August 2018




| Maturity | Products | Date |
|---|---|---|
| Validated | ATMS TDR/SDR | 06/15/18 |
| | VIIRS SDR | 06/15/18 |
| Provisional | CrIS SDR | 02/16/18 |
| | OMPS NM SDR | 02/18/18 |
| | OMPS NP SDR (pending MX2 TTO) | 02/18/18 (07/02/18 Mx2 TTO) |
| | VIIRS Imagery EDR | 02/19/18 |
| | Active Fire EDR | 02/19/18 |
| | Aerosol Optical Depth & Particle Size | 03/20/18 |
| | Aerosol Detection | 04/18/18 |
| | Sea Surface Temperature | 04/18/18 |
| | MIRS Products | 11/29/17 |
| | NUCAPS AVTP, AVMP | 06/15/18 |
| Beta | Cloud Mask | 04/18/18 |
| | Surface Reflectance | 06/15/18 |
| | NUCAPS O3, CO, CO2, CH4 and OLR | 06/15/18 |
| | OMPS Ozone EDR V8Pro, V8TOz | 02/13/18 |
| | ATMS Snow Fall Rate | 06/20/18 |

**N20 Pre-Launch and Post-Launch Algorithm Updates**

**Pre-Launch**

- ✓ Mounting Matrix Coefficient Tables for J1 Instruments
- ✓ PCT/LUT Updates
- ✓ End-to-End testing support to ensure data product integrity
- ✓ Schedules for L+90 Cal/Val activities and Post Launch Testing (PLT)

**Post-Launch**

- ✓ Support for PLT Activities
- ✓ PCT and LUT Updates
- ✓ OMPS weekly fast track dark table updates for operations
- ✓ VIIRS monthly straylight and DNB fast track updates for operations
- ✓ J1 EDR Delivery Algorithm Package (DAP) deliveries for Active Fire, SST, OMPS Ozone, MIRS, NUCAPS, Clouds, Aerosols and Cryosphere EDR algorithms

**SNPP Science Maintenance, Deliveries, Long Term Monitoring**

# Agenda; Highlights; Expected Outcomes

## Highlights

**Status** of SDR, EDR products and future **plans** for improvements

Each session features presentations on **applications** from end users

**Poster** presentations and lab demonstrations

NESDIS **Leadership** Brown Bag Lunch Presentation

**Trends and Drivers**: A unique session on overarching topics, such as Transition science to operation and MSN, AI/Deep Learning, reprocessing.

**Blended products workshop:** Current status, common approaches; future improvements

| | Monday 27 August | Tuesday 28 August | Wednesday 29 August | Thursday 30 August |
|---|---|---|---|---|
| 0830 - 1015 | Keynotes + Program Overviews | Soundings, Ozone, and Trace Gas EDRs<br>Soundings Initiative | Hydro EDRs (including GCOM) Hydrology Initiative | Blended Products Workshop |
| 1015 - 1030 | Break | Break | Break | Break |
| 1030 - 1200 | SDRs<br>Data Assimilation Initiative | Land EDRs<br>Flood & River Ice Initiative | Trends & Drivers | Blended Products Workshop |
| 1200 - 1315 | Lunch | Lunch | Dr. Volz Brown Bag Lunch Talk | Lunch |
| 1315 - 1445 | Ocean EDRs<br>Oceans Initiative | Smoke & Fire Initiatives | Imagery EDRs<br>Monitoring and Visualization | Blended Products Workshop |
| 1445 - 1530 | Break | Break | Break | Break |
| 1530 - 1700 | Atmosphere EDRs (Aerosols, Clouds, Volcanic Ash) Aviation Initiative | Cryosphere EDRs Arctic Initiative<br>Cal/Val System and Science Suports Minisession | Wrap Up | Blended Products Workshop |
| 1730 - 1900 | Poster Session | | | |

NCWCP | ESSIC 4102 | ESSIC 3rd Floor

ESSIC is located across the street from NCWCP in the MSquare Bldg., 5825 University Research Court

https://www.star.nesdis.noaa.gov/star/meeting_2018JPSSAnnual.php

## Outcomes:

**Annual Meeting Report** that summarized the sessions, major findings, users' recommendations, and follow up actions.

White paper on NESDIS operational blended products summarize the presentations and discussions of Blended Products Workshop

**Review team plans** for the upcoming year

Understanding of the program structure and process

Strategic planning for JPSS algorithm and Cal/Val development

# JPSS Poster Session and Lab Demonstrations

## Monday, August 27, 5:30-7:30 PM
## CICS - Proving Ground and Training Center
## 3rd Floor, 5825 University Research Court

| Time | Name of the Presenter | Demonstration |
|---|---|---|
| 5:45 – 5:55 PM | Scott Rudlosky, UMD, CICS | Overview of CICS Proving Ground and Training Center |
| 6:00 - 6:10 PM | Ryan Smith, Charlie Brown, and Tom Atkins, STAR | JSTAR-Mapper |
| 6:15 - 6:30 PM | Tony Reale, Bomin Sun, Mike Petty, Ryan Smith, Charlie Brown, and Lihang Zhou, STAR | NPROVS (NUCAPS and MIRS Sounding Products) |
| 6:30 – 6:45 PM | Patrick Meyers, Mark Sannutti, and Ralph Ferrao, UMD, CICS | JPSS Products in AWIPS |
| 6:50 - 7:00 PM | Karlis Mikelsons and Veronica Lance, STAR | OCVIEW |

# Summary

- ✓ JSTAR teams provide full support to the science product algorithm development and improvement, Cal/Val, and continuity to NOAA-20 and beyond.
- ✓ Suomi-NPP has produced ~7 years of excellent data products.
- ✓ NOAA-20 KPPs and SDR are operational. EDR products are going through Cal/Val Maturity reviews as scheduled, and some are ahead of the schedule.
- ✓ Excellent progress towards replacement and upgrades of S-NPP algorithms with NOAA Enterprise Algorithms, and reprocessing S-NPP data records with the most matured algorithms for consistent long-term high quality data products.
- ✓ Science outreaches thru Program Science such as holding Technical Interchange Meetings (TIMs) for in-depth discussions on collaborations with OAR/CPO Programs, and users from NOAA OAR Laboratories (ESRL and GFDL).
- ✓ Product quality monitoring systems for S-NPP/N20 – ICVS, EDR Long Term Monitoring, JPSS Mapper are in place for synergistic use of data products and analyzing long term trending, as well as the real-time event based applications.

# Moving Forward

- ✓ **JPSS-2 pre-launch** preparations started. Algorithm updates and delivery schedules are being worked out.
- ✓ **Common standards for Cal/Val** processes and Maturity for data products
- ✓ **Enterprise algorithms** and cost effective solutions for Science Mission Life-Cycle support
- ✓ **Reprocessing** using most matured algorithm for consistent long-term product quality metrics and working with NCEI/CLASS to make the data sets public available
- ✓ **Fusion** of polar and geostationary satellite constellation products towards measurement based approach (**service-oriented, mission-agnostic**)
- ✓ Engaged with JPSS AMP, OSPO, OSGS, OSAAP, other key partners to advance **Research to Operation**; Engaged with science programs through PGRR to realize the challenge of taking **O**perational Products-to-**A**pplications-to-**I**nformation (**OAI**) needed for decision makers.


# Thank You and Enjoy the Meeting!!